

REMARKS

Claims 1-97 remain in the application with claims 1, 2, 7, 8, 9 14, 15, 23, 31, 32, 36, 37, 41, 42, 46, 52, 53, 62, 72, 73, 84, 85, 96, and 97 having been amended hereby.

As will be noted from the Declaration, Applicants are citizens and residents of Japan and this application originated there.

Accordingly, the amendments made to the specification are provided to place the application in idiomatic English, and the claims are amended to place them in better condition for examination.

An early and favorable examination on the merits is earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE
IN THE ABSTRACT OF THE DISCLOSURE

Please amend the Abstract by rewriting same to read as follows.

In order to enable use of both real time access and random access and to achieve improvement of throughput [on] of a communication device and a communication network, a LAN terminal device 1, acting as a control station, allocates communication timing corresponding to a communication timing allocation request from a first LAN unit 2 and a second LAN unit 5 intending to transmit real time data and notifies each LAN terminal device connected to the same network of information indicating this allocated communication timing. A communication terminal of the requester transmits data through a real time region based on communication timing allocated [to itself] thereto and random data is transmitted through a random access region.

IN THE CLAIMS

Please amend claims 1, 2, 7, 8, 9 14, 15, 23, 31, 32, 36, 37, 41, 42, 46, 52, 53, 62, 72, 73, 84, 85, 96, and 97.

--1. (Amended) A communication method for [plural] a plurality of communication terminals sharing a single channel to permit a communication terminal to communicate at a predetermined communication cycle while avoiding a collision [of use of said channel] with an other communication terminal, comprising:

a communication timing registering step for[, upon start-up of communication,] allocating communication timing of a communication terminal intending to start [the] a communication within said communication cycle, upon start-up of the communication; and

a notifying step for notifying other communication terminals

sharing said channel of the allocated communication timing.

--2. (Amended) The communication method according to claim 1, wherein

at least one communication control unit for controlling said communication cycle is provided in a network comprised of [plural connected] the plurality of communication terminals sharing said channel,

said communication control unit, when said communication terminal intending to start communication transmits an allocation request for said communication timing to said communication control unit, executing said communication timing registering step and executing said notifying step.

--7. (Amended) The communication method according to claim 1, wherein said channel uses a carrier of a same predetermined frequency and avoiding [of] a collision [of use of said channel] is carried out by detecting presence or absence of said carrier.

--8. (Amended) A communication method for [plural] a plurality of communication terminals sharing a single channel to communicate bi-directionally between a call terminal [which] that is [said] a communication terminal for calling and a mating terminal [which] that is [said] a communication terminal called by said call terminal at a predetermined communication cycle while avoiding a collision of use [of said channel] with other communication terminals, comprising:

a calling step for said call terminal to call said mating terminal [of an object] by random access;

a responding step for said mating terminal to respond to said call terminal when accepting a call from said call terminal;

a communication timing allocation step for[, if said response arises corresponding to said call,] allocating communication timing for said call terminal and said mating terminal in said communication cycle, when said response arises corresponding to said call; and

a notifying step for notifying [each of] the allocated communication timing to other communication terminals sharing said channel,

said call terminal and said mating terminal executing bi-directional communication by executing transmission based on the corresponding communication timing at every communication cycle.

--9. (Amended) The communication method according to claim 8, wherein

at least one communication control unit for controlling said communication cycle is provided in a network comprised of [plural connected] the plurality of communication terminals sharing said channel,

further comprising a timing allocation request step for said call terminal, if a response to said call arises from said mating terminal, to form an allocation request for requesting to allocate said communication timing to both itself and said mating terminal and to transmit to said communication control unit,

said communication control unit executing said communication timing allocation step and said notifying step corresponding to said allocation request.

--14. (Amended) The communication method according to claim 8, wherein said channel uses a carrier of a same predetermined frequency and avoiding [of] a collision [of use of said channel] is carried out by detecting presence or absence of said carrier

on said channel.

--15. (Amended) A communication method for [plural] a plurality of communication terminals sharing a single channel to communicate at a predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, comprising:

a communication order allocating step for[, upon start-up of communication,] allocating communication order to a communication terminal intending to start a communication, upon start-up of the communication;

a notifying step for notifying the allocated communication order to other communication terminals sharing said channel;

an empty time setting step for setting [the] a length of empty time in said channel capable of starting transmission of data corresponding to the allocated communication order in said communication terminal to which said communication order is allocated; and

a data transmitting step for transmitting data, [if] when emptiness of the same length as said empty time set up in said empty time setting step is detected on said channel in said communication terminal to which said communication order is allocated[, transmitting data].

--23. (Amended) A communication method comprising:

a notifying step for [plural] a plurality of communication terminals sharing a single channel to notify a call terminal [which] that is [said] a communication terminal for calling and a mating terminal which is said communication terminal called by said call terminal at a predetermined communication cycle while avoiding a collision [of use of said channel] with an other

communication terminal;

an empty time setting step for setting [the] a length of empty time in said channel capable of starting transmission of data corresponding to the allocated communication order in said communication terminal to which said communication order is allocated; and

a data transmitting step for transmitting data, [if] when emptiness of the same length as said empty time set up in said empty time setting step is detected on said channel in said communication terminal to which said communication order is allocated[, transmitting data],

said call terminal and said mating terminal executing bi-directional communication by executing transmission at each corresponding communication order at every communication cycle.

--31. (Amended) A communication system[, wherein] comprising:

at least one communication control unit and [plural] plurality of other communication terminals [share] sharing a single channel and said [plural] plurality of other communication terminals communicate at a predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals,

each of said [plural] plurality of communication terminals [comprising] including:

[an] allocation request means for, upon start-up of communication, generating a communication timing allocation request and transmitting this to said communication control unit; and

[a] transmission control means for transmitting data at communication timing allocated by said communication control unit

at every communication cycle,

said communication control unit [comprising] including:

[a] means for controlling said communication cycle;

[a] communication timing allocation means for allocating said communication timing to said communication terminal of a requester corresponding to said allocation request from each of said plural communication terminals; and

[a] communication timing notifying means for transmitting said communication timing allocated by said communication timing allocation means to each of said plural communication terminals.

--32. (Amended) The communication system according to claim 31, wherein

each of said [plural] plurality of communication terminals has a random access control means for,

if data to be transmitted is real time data such as voice data and image data, transmitting said real time data by said transmission control means based on said communication timing set up by said communication control unit corresponding to said allocation request, and

if data to be transmitted is random data generated at random, transmitting through random access region other than the real time region for transmitting said real time data in said communication cycle.

--36. (Amended) A communication system[, wherein] comprising:

at least a communication control unit and [plural] a plurality of other communication terminals [share] sharing a channel and each of said [plural] plurality of communication terminals carries out bi-directional communication at every

predetermined communication cycle while avoiding a collision of use of said channel with other communication terminals,

each of said plural communication terminals having

[a] communication request means for forming a communication request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[an] allocation request means for, if a response is returned from said mating terminal corresponding to said communication request formed by said communication request means, forming an allocation request of communication timing for itself which is a call terminal and said mating terminal and transmitting this to said communication control unit;

[a] responding means for, when responding to a communication request transmitted to itself, forming a response to be returned to the call terminal and transmitting this to said call terminal; and

[a] transmission control means for transmitting data corresponding to communication timing for self from said communication control unit,

said communication control unit having:

[a] means for controlling a communication cycle;

[a] communication timing allocation means for allocating said communication timing to said call terminal and said mating terminal corresponding to said allocation request of the communication timing to said call terminal and said mating terminal from said call terminal; and

[a] communication timing notifying means for notifying each of said plural communication terminals of said communication timing allocated by said communication timing allocation means.

--37. (Amended) The communication system according to claim

36, wherein each of said plural communication terminals has

[a] random access control means for, [if] when it is intended to transmit real time data such as voice data and image data, [transmit] transmitting data based on said communication timing by a control of said transmission control means, and [if] when it is intended to transmit random data generated at random by random access, transmitting the random data through a random access region other than the real time region for transmitting said real time data within said communication cycle.

--41. (Amended) A communication system[, wherein] comprising:

at least a communication control unit and [plural] a plurality of communication terminals [share] sharing a channel and each of said plural communication terminals carries out communication at every predetermined communication cycle while avoiding a collision of use of said channel with other communication terminals,

each of said plural communication terminals having:

[an] allocation request means for, upon start-up of communication, generating a communication order allocation request and transmitting this to said communication control unit;

[an] empty time setting means of setting the length of an empty time of said channel capable of starting transmission of data corresponding to said communication order allocated by said communication control unit; and

[a] data transmitting control means for, if emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel, transmitting data from itself,

said communication control unit [comprising] including:

[a] means for controlling said communication cycle;

[a] communication order allocation means for allocating said communication order to said communication terminal of a requester corresponding to said allocation request from each of said plural communication terminals; and

[a] communication order notifying means for transmitting said communication order allocated by said communication order allocation means to each of said plural communication terminals.

--42. (Amended) The communication system according to claim 41, wherein

each of said [plural] plurality of communication terminals has [a] data transmission detecting means for detecting whether [or not] a communication terminal having a higher communication order than itself transmits data, and

[if] when said data transmission detecting means detects that a communication terminal having a higher communication order than itself transmits data, said empty time setting means resets said empty time set in itself shorter corresponding to said communication order allocated.

--46. (Amended) A communication system, [wherein] comprising:

at least a communication control unit and [plural] a plurality of communication terminals [share] sharing a channel and each of said [plural] plurality of communication terminals carries out bi-directional communication at every predetermined communication cycle while avoiding a collision of use of said channel with other communication terminals,

each of said plural communication terminals having

[a] communication request means for forming a communication

request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[an] allocation request means for, if a response is returned from said mating terminal corresponding to said communication request formed by said communication request means, forming an allocation request of communication order for itself which is a call terminal and said mating terminal and transmitting this to said communication control unit;

[a] responding means for, when responding to a communication request transmitted to itself, forming a response to be returned to the call terminal and transmitting this to said call terminal;

[an] empty time setting means of setting the length of an empty time of said channel capable of starting transmission of data corresponding to said communication order allocated by said communication control unit; and

[a] data transmitting control means for transmitting data, [if] when an emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel[, transmitting data],

said communication control unit having:

[a] means for controlling a communication cycle;

[a] communication order allocation means for allocating said communication order to said call terminal and said mating terminal corresponding to said allocation request of the communication order to said call terminal and said mating terminal from said call terminal; and

[a] communication order notifying means for notifying each of said plural communication terminals of said communication order allocated by said communication order allocation means.

--52. (Amended) A communication terminal of a communication

system, wherein

at least a communication control unit and [plural] a plurality of communication terminals share a channel and each of said [plural] plurality of communication terminals carries out communication at every predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, comprising:

[an] allocation request means for, prior to start-up of data communication, generating a communication timing allocation request and transmitting this to said communication control unit; and

[a] transmission control means for transmitting data at said communication timing allocated by said communication control unit at every said communication cycle.

--53. (Amended) A communication terminal, wherein

plural communication terminals share a single channel to communicate at a predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, comprising:

[a] communication timing allocation means for prior to start-up of data communication, allocating communication timing to itself and notifying other communication terminals of this; and

[a] transmission control means for transmitting data at said communication timing at every communication cycle.

--62. (Amended) A communication terminal of a communication system, wherein

at least a communication control unit and [plural] a plurality of communication terminals share a channel and each of

said [plural] plurality of communication terminals carries out bi-directional communication at every predetermined communication cycle while avoiding collision [of use of said channel] with other communication terminals, [further] comprising:

[a] communication request means for forming a communication request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[an] allocation request means for, if a response from said mating terminal is returned corresponding to said communication request formed by said communication request means, forming a communication timing allocation request to itself which is a call terminal and said mating terminal and transmitting this to said communication control unit;

[a] responding means for, when responding to a communication request transmitted to itself, forming a response to be returned to said call terminal and transmitting this to said call terminal; and

[a] transmission control means for transmitting data corresponding to communication timing sent from said communication control unit to itself.

--63. (Amended) A communication terminal of a communication system, wherein

[plural] a plurality of communication terminals [sharing] share a single channel communicate bi-directionally at a predetermined communication cycle while avoiding a collision [of use of said channel] with each other [communication terminals], comprising:

[a] communication request means for forming a communication request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[a] communication timing allocation means for, if a response from said mating terminal is returned corresponding to said communication request formed by said communication request means, allocating communication timing to itself which is a call terminal and said mating terminal and notifying other communication terminals of this;

[a] responding means for, when responding to a communication request transmitted to itself, forming a response to be returned to said call terminal and transmitting this to said call terminal; and

[a] transmission control means for transmitting data corresponding to said communication timing.

--72. (Amended) A communication terminal of a communication system, wherein

at least a communication control unit and [plural] a plurality of communication terminals share a channel and each of said [plural] plurality of communication terminals carries out communication at every predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, comprising:

[an] allocation request means for, prior to start-up of data communication, generating a communication order allocation request and transmitting this to said communication control unit;

[an] empty time setting means of setting the length of an empty time of said channel capable of starting transmission of data corresponding to said communication order allocated by said communication control unit; and

[a] data transmitting control means for, if emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel at every communication

cycle, transmitting data.

--73. (Amended) A communication terminal, wherein

[plural] a plurality of communication terminals [sharing] share a single channel carry out communication at a predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, comprising:

[a] communication order allocation means for, prior to start-up of data communication, allocating communication order to itself and notifying other communication terminals of this;

[an] empty time setting means of setting the length of an empty time of said channel capable for starting transmission of data corresponding to said communication order allocated; and

[a] data transmitting control means for, if emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel at every communication cycle, transmitting data.

--84. (Amended) A communication terminal of a communication system, wherein

at least a communication control unit and [plural] a plurality of communication terminals share a channel and each of said [plural] plurality of communication terminals carries out bi-directional communication at every predetermined communication cycle while avoiding a collision [of use of said channel] with other communication terminals, [further] comprising:

[a] communication request means for forming a communication request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[an] allocation request means for, if a response from said mating terminal is returned corresponding to said communication

request formed by said communication request means, forming a communication order allocation request to itself which is a call terminal and said mating terminal and transmitting this to said communication control unit;

[a] responding means for, when responding to a communication request transmitted to itself, forming a response to be returned to said call terminal and transmitting this to said call terminal;

[an] empty time setting means of setting the length of an empty time of said channel capable of starting transmission of data corresponding to said communication order allocated to itself by said communication control unit; and

[a] data transmitting control means for, if an emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel, transmitting data.

--85. (Amended) A communication terminal of a communication [cycle] system, wherein

[plural] a plurality of communication terminals [sharing] share a single channel communicate bi-directionally at a predetermined communication cycle while avoiding a collision [of use of said channel] with each other [communication terminals], comprising:

[a] communication request means for forming a communication request for calling a mating terminal of an object and transmitting this to said mating terminal by random access;

[a] communication timing allocation means for, if a response from said mating terminal is returned corresponding to said communication request formed by said communication request means, allocating communication order to itself which is a call terminal

and said mating terminal and notifying other communication terminals of this;

[a] responding means for, when responding to a communication request for itself, forming a response to be returned to said call terminal and transmitting this to said call terminal;

[an] empty time setting means of setting the length of an empty time of said channel capable of starting transmission of data corresponding to said communication order allocated; and

[a] data transmission control means for transmitting data, [if] when emptiness of the same length as that of said empty time set up by said empty time setting means is detected on said channel[, transmitting data].

--96. (Amended) [The] A communication control unit of a communication system, wherein

[at least a communication control unit and plural] a plurality of communication terminals share a channel and each of said [plural] plurality of communication terminals carries out communication at every predetermined communication cycle while avoiding a collision [of use of said channel] with each other [communication terminals], [further] comprising:

[a] means for controlling said communication cycle;

[a] communication timing allocation means for allocating communication timing to said communication terminal of a requester corresponding to a communication timing allocation request from each of said plural communication terminals; and

[a] communication timing notifying means for notifying each of said plural communication terminals of said communication timing allocated by said communication timing allocation means.

--97. (Amended) [The] A communication control unit of a

communication system, wherein

[at least a communication control unit and plural] a plurality of communication terminals share a channel and each of said [plural] plurality of communication terminals carries out communication at every predetermined communication cycle while avoiding a collision [of use of said channel] with each other [communication terminals], [further] comprising:

[a] means for controlling said communication cycle;

[a] communication order allocation means for allocating a communication order to said communication terminal of a requester corresponding to a communication order allocation request from each of said plural communication terminals; and

[a] communication order notifying means for notifying each of said plural communication terminals of said communication order allocated by said communication order allocation means.